Milk needs to be more than green – how do we keep dairy farming sustainable?

Dr. Jude L. Capper

EuroTier 2018 Cattle and Pig Event, Hannover, Germany
November 12th 2018

Source: Created by Dr. Jude L. Capper, 2018
Global beef, pork and poultry consumption: 1980 - 2050

Meat Consumption (million MT)

Arable Land (ha/person)

Source: Created by Dr. Jude L. Capper, 2018. Data from: Bauman and Capper (2011) Southwest Nutrition and Management Conference, Tempe, AZ.
The global livestock industry is under threat

Fight Climate Change with Diet Change

ALL ANIMALS HAVE THE SAME PARTS

SOLVE = 80% GLOBAL WARMING PROBLEMS

http://animals.change.org/blog/view/save_the_animals_save_the_planet_blog_action_day_09_climate_change
http://www.peta.org/mc/ads/PAMPpartsPETA300.jpg
Every dairy production system can be sustainable
Every dairy production system can be sustainable
Every dairy production system can be sustainable
Sustainability and One Health are interconnected.
What does sustainability mean to the consumer?

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seasonal fruit and veg</td>
<td>36%</td>
</tr>
<tr>
<td>Food waste</td>
<td>34%</td>
</tr>
<tr>
<td>Water use</td>
<td>32%</td>
</tr>
<tr>
<td>Use of natural resources</td>
<td>31%</td>
</tr>
<tr>
<td>Air and water pollution</td>
<td>29%</td>
</tr>
<tr>
<td>Animal welfare</td>
<td>29%</td>
</tr>
<tr>
<td>Healthy food</td>
<td>28%</td>
</tr>
<tr>
<td>Organic food</td>
<td>28%</td>
</tr>
<tr>
<td>Food safety</td>
<td>28%</td>
</tr>
</tbody>
</table>

Source: Created by Dr. Jude L. Capper, 2018. Data from: Bouwman et al. (2016) Consumers’ Knowledge About the Determinants for a Sustainable Diet. SUSFANS, The Hague, The Netherlands. Web-survey of 5,043 consumers across 6 countries. Question: “In your opinion, which of these attributes have to do with sustainable food?” Highest agreement value of attributes shown = 49.0%, lowest 17.9%.
Dairy products have an intermediate carbon footprint compared to other foods

GHG emissions (kg CO₂-eq per kg food)

- Meat: 6.2
- Dairy: 3.6
- Grains: 3.2
- Sweets: 2.6
- Fruit/Veg: 1.9
- Milk: 1.2

All foods have an environmental impact
“Donnerstag ist VeggieTag” is gaining popularity

Heute vegetarisch essen

der Gesundheit, den Tieren, der Umwelt zuliebe

Source: Created by Dr. Jude L. Capper, 2018; Photo from: http://als.basics.de/~berin/image/c03/c5959914557.jpg
Livestock production is not the only contributor to Germany’s carbon footprint.

German livestock production accounts for ~4.8% of total national GHG emissions (Eurostat, 2016).

Includes CH₄ and N₂O, plus 30% of cropping-associated emissions.
If everybody in Germany went meat and dairy-free every Monday for a year…

Adopting a meat and dairy-free diet for one day per week would reduce the national carbon footprint by less than 0.7%.

Improving cattle productivity reduces environmental impact of milk and meat.

- **Total cattle**
  - **Total time**
  - **Growth rate**
  - **Meat yield**
  - **Milk yield**

- **Land**
  - **Water**
  - **Fuel**
  - **GHG**

- **€€€**

A negative correlation exists between yield and carbon emissions.

British dairy herd performance relative to carbon emissions

- **Best carbon ftpt**
- **Worst carbon ftpt**
- **Mean**

**Index compared to the mean (1=100%)**

- **Herd Size**: 182 head
- **Milk Sold**: 1.3 mil lit.
- **Yield per Cow**: 7,616 lit.

European dairy cow productivity has improved significantly over time.
Efficiency losses increase environmental impact and economic cost

Inadequate nutrition
Reproductive failure
Lameness
Mastitis
Metabolic disease
Infectious disease
Long dry period
Late age at first calving
Antibiotic residues
Feed wastage
Poor pasture management

Source: Created by Dr. Jude L. Capper, 2018.
Got...teats? Soybeans do not have mammary glands

Source: Created by Dr. Jude L. Capper, 2018.
Drinks vary in nutrient density and greenhouse gas emissions

<table>
<thead>
<tr>
<th></th>
<th>Nutrient Density</th>
<th>Carbon footprint g CO₂/g drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>53.8</td>
<td>99</td>
</tr>
<tr>
<td>Orange Juice</td>
<td>17.2</td>
<td>61</td>
</tr>
<tr>
<td>Soy Drink</td>
<td>7.6</td>
<td>30</td>
</tr>
<tr>
<td>Oat Drink</td>
<td>1.5</td>
<td>21</td>
</tr>
<tr>
<td>Red Wine</td>
<td>1.2</td>
<td>204</td>
</tr>
<tr>
<td>Soda</td>
<td>0.0</td>
<td>109</td>
</tr>
<tr>
<td>Water</td>
<td>0.0</td>
<td>101</td>
</tr>
<tr>
<td>Beer</td>
<td>0.0</td>
<td>10</td>
</tr>
</tbody>
</table>

Nutrient density should be included when assessing carbon footprint

\[ \text{NDC Index} = \frac{\text{Nutrient Density}}{\text{GHG Emissions}} \]

Can we grow human food crops everywhere?

Source: Created by and photo from Dr. Jude L. Capper, 2018.
Can we grow human food crops everywhere?
Can we grow human food crops everywhere?
All these industries provide by-products fed to animals
Feed efficiency ratios vary between systems and species.

- Dairy: 1.1
- Suckler beef: 27.5
- Cereal beef: 7.8
- Pork: 3.6
- Poultry: 2.0
- Eggs: 2.2

Source: Created by Dr. Jude L. Capper, 2018; data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. Animal.
Feed efficiency metrics must consider competition for human-edible foods.

Source: Created by Dr. Jude L. Capper, 2018; data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. Animal.
Dairy and beef have favorable human-edible protein input to output ratio.
This year, #Veganuary was trending
This year, #Veganuary was trending

Globally, 168,500 people took part

101,100 (60%) Vegan
Vegetarian
Pescetarian

67,400 (40%) Omnivores
(13% of Hannover population)

2,925 confirmed staying vegan

Eating-Animals-Plant-Based-Stay-Vegan and http://www.bbc.com
How do you convert a vegan?
When I was 15, I was a vegan
Let’s make #Februdairy happen! 28 days, 28 positive #dairy posts. From cute calves and #cheese on crumpets, to belligerent bulls and juicy #beef #burgers - who's in? #SmxConf18
28 days of positive dairy posts
5 easy tips for positive communication

1. Share your values
2. Stay positive, polite and personal
3. Keep it short, simple and see-through
4. Agree to disagree
5. Know when to walk away

Source: Created by Dr. Jude L. Capper, 2018.
As a #dairy #farmer my goal is to make sure my #cows are taken care of to the best of my ability. Something I take pride in. #dairygood

12/11/2014, 18:07
Stay positive, polite and personal

hummus wife
@eat___notpigs

Dairy products contain pus, hormones, antibiotics, and carcinogenic properties. Happy #NationalCheeseDay 😬

04/06/2018, 14:00

Source: Created by Dr. Jude L. Capper, 2018. Photo from: http://twitter.com
Can the hormones in dairy have impacts on our bodies?

1 litre of milk = 10 ng oestrogen

Contraceptive pill = 35,000 ng oestrogen

One pill = 3,500 litres of milk Every single day.

Keep it short, simple and see-through

Kirsty
@Dairy_is_scary

Rape rack

Source: Created by Dr. Jude L. Capper, 2018. Photo from: http://twitter.com
Sometimes we have to agree to disagree

Moonmoon Glitterkiss
@buatharfuath

I’m a vegan and I live in a farming community. No amount of talking or “education” made the fact that the cows who were no longer “useful” were brought to slaughter.

16/01/2018, 23:09
Know when to walk away

@Bovidiva Why would someone who had breast cancer consume #dairy? WTF? Don’t be shocked when the cancer comes back, lol.

We got the science, more and more people wake up every day, your psychopathic industry is slowly dying - and we can’t wait for it to be gone. Go #vegan.

8:33 PM - 28 Jan 2018
#Februdairy: blood, sweat, tears and awful lot of cheese...
...leading to some really bad activist Photoshopping.
The livestock industry has an image problem

Some on-farm practices cannot be justified

Mail Online

Viewers' outrage over harrowing scenes of day-old calves being lined up and shot DEAD just because they're male

- Three Jersey calves were filmed being killed on the Channel 4 programme featuring farmer Jimmy Doherty
- Nearly 60 people complained about the graphic scenes aired at 9.30pm on Tuesday

By PAUL REVOIR FOR MAILONLINE

Harrowing scenes of newly-born dairy calves being lined up and shot dead simply because they are male have left television viewers sickened.

The images of three Jersey calves being killed were filmed to highlight the grim reality of the dairy industry.

Consumer perception equals cruel reality?

We should always think twice before posting images that can be misconstrued on social media.

Source: Created by Dr. Jude L. Capper, 2018. Photo from http://www.facebook.com

Farmers Guardian
When you get caught trying to sneak off the farm early... 😏
Consumer perception equals cruel reality?

This calf is about to be killed with a bolt gun. Give a [blank] & go #vegan

Source: Created by Dr. Jude L. Capper, 2018. Photo from: http://twitter.com
Consumer decision making: cultural cognition. We trust people we admire.
Use cultural cognition by reaching out to celebrities to promote agriculture

England rugby player credited <3 week recovery from broken leg to drinking 2 pints of milk per day.

Need to communicate with consumers who don’t have fixed opinions of farming.

Focus here

Opinion of Issue X

Angry

Happy
Need to promote trust to ensure social acceptability and sustainability

- Perceived lack of concern
- Unrealistic images
- Complicated justifications
- Opacity

- Shared values
- Realistic images
- Clear answers
- Transparency

Source: Created by Dr. Jude L. Capper, 2018.
Thank you!

jude@livestocksustainability.com
http://bovidiva.com/presentationlinks

Who's the new heifer? Never seen herbivore.

@bovidiva
Bovidiva
www.bovidiva.com

Source: Created by Dr. Jude L. Capper, 2018.